UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/526,930	03/16/2000	Timothy M. Schmidt	TI-30734	1461

23494 7590 07/16/2008

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
DALLAS, TX 75265

EXAMINER	
KIM, KEVIN	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
07/16/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com
uspto@dlemail.itg.ti.com

Office Action Summary	Application No.	Applicant(s)	
	09/526,930	SCHMIDT ET AL.	
	Examiner	Art Unit	
	Kevin Y. Kim	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,6-22,28-38 and 40-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6-22,28-38 and 40-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on March 26, 2008 has been entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. Claims 1-4, 6-11, 28-38, 40-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rshid-Farrokhi et al (US 6,400,780, previously cited) in view of Reudink (US 5,648,968 previously cited).

Claims 1, 37, 38, 42 and 45.

Rshid-Farrokhi et al discloses a method and system of communication between a transmitter (101) having a plurality of antennas (105) and at least on receiver (103), comprising

phase shifting a plurality of data communication signals (IN) from a plurality of a respective plurality of channels to generate derived versions of each channel communication signal, each derived version having its desired data communication signal phase shift and/or amplitude scaled, in that weights (W) (which is a combination of amplitude scaling and phase adjustment as known in the art) are applied at multipliers (113),

transmitting the derived versions of each data communication signal to respective antenna within the plurality of antennas (105-1,…, 105-k); and

providing a distinct delay (117) associated with each derived version of the channel communication signal and its respective antenna.

Rshid-Farrokhi et al fails to teach altering the distinct delay in response to a change of an estimated delay profile. Reudink teaches varying a delay applied to a transmission signal in a similar diversity transmitter in response to a change of an estimated delay profile for the purpose of improving reception at a receiver. See col. 8, line 42 ~ col. 9, line 9. Thus, it would have been obvious to one skilled in the art at the time the invention was made to vary the delay (117) of Rshid-Farrokhi et al in response to a delay profile change for the purpose of signal reception quality at the receiver as taught by Reudink.

Claim 2.

Rshid-Farrokhi et al discloses receiving at the transmitter, data communication uplink signals, i.e., feedback, (FEEDBACK CHANNEL) from each remote receiver in communication with the transmitter and estimating a path profile associated with each received uplink signal. See col.5, lines 45-56.

Claim 3.

Rshid-Farrokhi et al discloses determining a distinct communication signal delay associated with each channel of the plurality of communication channels, wherein each communication signal delay is derived from data associated with the respective uplink signal. See col.3, lines 47-60.

Claim 4.

Rshid-Farrokhi et al discloses applying weight vectors to a transmit signal, wherein the weight vector performs "amplitude scaling" as well as phase adjustment.

Claim 6.

Rshid-Farrokhi et al discloses that a communication signal transmitted to each antenna is associated with a code division multiple access (CDMA) data signal. See col.3, lines 35-47.

Claim 7.

Rshid-Farrokhi et al discloses that a communication signal transmitted to each antenna is associated with a time division multiple access (TDMA) data signal. See col.3, lines 35-47.

Claims 8 and 9.

Rshid-Farrokhi et al discloses a method of communication between a transmitter (101) having a plurality of antennas (105) and at least on receiver (103), comprising

transmitting a communication signal to each of the antennas;

providing a distinct delay (117) associated with each communication signal and its respective antenna;

measuring channel information between the transmitter and the receiver;

determining a desired phase shift associated with data communication signal;

and selectively phase shifting the data communication signals (IN) to generate derived versions of each channel communication signal, each derived version having its desired data communication signal phase shift, in that weights (W) (which is a combination of amplitude scaling and phase adjustment as known in the art) are applied at multipliers (113),

Rshid-Farrokhi et al fails to teach receiving uplink signal from the receiver and estimating a delay profile and determining the distinct delay in response to a change of an

estimated delay profile. Reudink teaches varying a delay applied to a transmission signal in a similar diversity transmitter in response to a change of an estimated delay profile for the purpose of improving reception at a receiver. See col. 8, line 42 ~ col. 9, line 9. Thus, it would have been obvious to one skilled in the art at the time the invention was made to vary the delay (117) of Rshid-Farrokhi et al in response to a path delay change for the purpose of signal reception quality at the receiver as taught by Reudink.

Claim 10.

Rshid-Farrokhi et al discloses that a communication signal transmitted to each antenna is associated with a code division multiple access (CDMA) data signal. See col.3, lines 35-47.

Claim 11.

Rshid-Farrokhi et al discloses a communication signal transmitted to each antenna is associated with a time division multiple access (TDMA) data signal. See col.3, lines 35-47.

Claim 28.

Rshid-Farrokhi et al teaches the communication system can be implemented in various ways including a software performing the function. In that case, an algorithmic software directs a data processor using information gathered in a data storage unit, i.e., a memory, controls the transmitter such that based on a measured path profile a distinct delay is provided to a data communication signal, as explained in connection with claim 1 above. See col. 2, line 61 ~ col. 3, line 6.

Claim 29.

Rshid-Farrokhi et al teaches at least one remote receiver (103).

Claim 30.

Rshid-Farrokhi et al discloses that a communication signal transmitted to each antenna is associated with a time division multiple access (TDMA) data signal. See col.3, lines 35-47.

Claim 31.

Rshid-Farrokhi et al discloses that a communication signal transmitted to each antenna is associated with a code division multiple access (CDMA) data signal. See col.3, lines 35-47.

Claim 32.

Rshid-Farrokhi et al disclose a communication system with a transmitter having an antenna system comprising

a plurality of spaced apart antennas (105);

signal distributing means (107) for coupling the communication signal (IN) between a transmitter and the plurality of spaced apart antennas (105);

signal deriving means (109) operatively coupled to the signal distributing means for providing communication signal phase parameters determined from channel measurement information (167) and

delaying means (117) operatively coupled to plurality of spaced apart antennas and the signal distributing means for providing discrete delays.

Rshid-Farrokhi et al fails that the delaying means is variable. Reudink teaches varying a delay applied to a transmission signal in a similar diversity transmitter in response to a change of an estimated delay profile for the purpose of improving reception at a receiver. See col. 8, line 42 ~ col. 9, line 9. Thus, it would have been obvious to one skilled in the art at the time the invention was made to vary the delay (117) of Rshid-Farrokhi et al in response to a delay profile change for the purpose of signal reception quality at the receiver as taught by Reudink.

Claims 33 and 34.

Rshid-Farrokhi et al teaches the communication system can be implemented in various ways including a software performing the function. In that case, an algorithmic software directs a data processor using information gathered in a data storage unit, i.e., a memory, controls the transmitter such that based on a measured path profile a distinct delay is provided to a data communication signal. See col. 2, line 61 ~ col. 3, line 6.

Claims 35, 40, 43 and 46.

Rshid-Farrokhi et al discloses a communication signal transmitted to each antenna is associated with a code division multiple access (CDMA) data signal. See col.3, lines 35-47.

Claims 36, 41, 44 and 47.

Rshid-Farrokhi et al discloses a communication signal transmitted to each antenna is associated with a time division multiple access (TDMA) data signal. See col.3, lines 35-47.

Claim Rejections - 35 USC § 102

4. Claims 12-14,17-19 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Reudink (US 5,648,968).

Claim 12.

Reudink discloses a communication system, comprising;

a transmitter having a plurality of spaced apart antennas (801, 802,…, 803);

a channel measurement circuit (83) coupled to the plurality of spaced apart antennas and arranged to produce a delay profile estimate of a delay between multipath signals from a remote transmitter, see col. 8, line 67 ~ col. 9, line 3;

a channel input terminal (81) coupled to receive a data communication signal (A); and

a delay circuit (D_1, D_2), coupled between the channel input terminal and the plurality of spaced apart antennas, providing a distinct delay in the data communications signal in response to the delay profile estimate, see col. 9, lines 3-9.

Claim 13.

Reudink discloses the data communication signal transmitted to each antenna are associated with a code division multiple access (CDMA) data signal. See col. 4, line 26.

Claim 17.

Reudink discloses amplitude scaling the data communication signal. See col. 8, lines 54-55.

Claim 18.

Reudink discloses a communication system, comprising;

a transmitter having a plurality of spaced apart antennas (801, 802,…, 803);

an element (82) providing a derived version of each communication signal transmitted from a transmitter channel to the plurality of spaced apart antennas; and

a delay element (D_1, D_2), coupled between the channel input terminal and the plurality of spaced apart antennas, providing a distinct delay in the data communications signal in response to a change of a delay between multipath signals from the at least one remote transceiver. See col. 9, lines 3-9.

Claim 19.

Reudink discloses the data communication signal transmitted to each antenna are associated with a code division multiple access (CDMA) data signal. See col. 4, line 26.

Claim 22.

Reudink discloses amplitude scaling the data communication signal. See col. 8, lines 54-55.

Claim Rejections - 35 USC § 103

5. Claim 14, 15, 16, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reudink, as applied to claims 12, 18 above, in view of Rshid-Farrokhi et al (US 6,400,780, previously cited).

Claims 14 and 20.

Reudink discloses all the subject matter as explained above except for the transmitter carrying TDMA signal. Rshid-Farrokhi et al teaches a diversity transmitter designed to carry not only CDMA signals but also TDMA signal with a slight modification. See col. 3, lines 36-47. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the diversity transmitter of Reudink to carry TDMA signal as taught by Rshid-Farrokhi et al.

Claims 15, 16 and 21.

Rshid-Farrokhi et al teaches phase shifting and amplitude scaling the data communication signal in response to a channel measurement to reduce SINR. See Fig.1 showing that weight vector is applied to the data communication signal (IN), where weight vector is a combination of amplitude scaling and phase adjustment as known in the art. Thus, it would have been obvious to one skilled in the art at the time the invention was made to phase shifting and/or amplitude

scaling the data communication signal of Reudink as taught by Rshid-Farrokhi et al for the purpose of improving signal quality.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y. Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin Y Kim/
Primary Examiner, Art Unit 2611